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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,784	11/21/2003	Stephen R. Forrest	10644/60902	2938

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EXAMINER	
DIAMOND, ALAN D	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/719,784	FORREST ET AL.	
	Examiner	**Art Unit**	
	Alan Diamond	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 11212003, 02052004, 04042005

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 18 and 30 are objected to because of the following informalities: At line 1 in each of claims 18 and 30 the word "A" should be changed to "An". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 26 and 30-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 is indefinite because "the metal layer" lacks positive antecedent support in claim 18.

Claim 30 is incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the multiple subcells, the anode and the cathode. The same applies to dependent claims 31-37.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 18, 19, 22-25, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al (WO 00/11725) in view of Sato et al (U.S. Patent 4,479,028) and Hanak (U.S. Patent 4,316,049).

As seen in Figure 8A, 8B, 8C, 8D, and 9 Forrest et al '725 teaches a stacked organic photosensitive optoelectronic device that comprises in order, an anode, a plurality of photosensitive optoelectronic subcells, and a cathode (see page 1, lines 12-15; page 7, line 33 through page 37, line 1). An example of a heterojunction for a subcell in the stacked device is CuPc/PTCDA or CuPc/PTCBI (see the paragraph bridging cols. 33 and 34). Other heterojunctions are shown on Table 1 at pages 44-45, and include heterojunctions that have C_{60} buckminsterfullerene as an electron transport layer. Between each of the subcells is a semitransparent metallic layer of, for example, 10% Ag and 90% M, which has a thickness of 100 Angstroms or less (see page 34, line 12 through page 35, line 26). Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack" (see page 38, lines 22-27). Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of the device (see page 38, line 27 through page 39, line 1). Alternatively, when sufficient electromagnetic radiation incident on each face is able

to traverse the device, then the layers in the subcells in the center of the device are made thicker than the layers in subcells (see page 39, lines 9-13). The adjustment of the thickness of the sublayers is to provide uniform current levels from each cell (see page 39, lines 12-13). Forrest et al '725 teaches the limitations of the instant claims, other than the differences which are discussed below.

Forrest et al '725 does not specifically recite that the current generated by two of its subcells differs by less than 10%. However as noted above, Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack" (see page 38, lines 22-27). Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of the device (see page 38, line 27 through page 39, line 1). Alternatively, when sufficient electromagnetic radiation incident on each face is able to traverse the device, then the layers in the subcells in the center of the device are made thicker than the layers in subcells (see page 39, lines 9-13). The adjustment of the thickness of the sublayers is to provide uniform current levels from each cell (see page 39, lines 12-13). Indeed, the adjustment of the thickness of subcell layers in multi-subcell solar cell devices so that each subcell produces equal current is a well known concept in the solar cell art. For example, Sato et al teaches that "[i]n the double-layer tandem device, the maximum output current is

generated when the photovoltaic current of one of the two cells is equal to the photovoltaic current of the other cell, so it is very important to select suitable thicknesses of the cells" (see col. 4, lines 23-27). Likewise, Hanak et al, at col. 3, lines 21-31, notes the adjustment of thickness so that the current produced by solar layers (38) and (42) are the same (see the paragraph bridging paragraphs 2 and 3; and col. 3, lines 43-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Forrest et al '725's stacked organic photosensitive optoelectronic device such that the current generated in a first subcell of the stack is equal to or essentially equal to the current produced by a second subcell in the stack because Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack"; Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of the device; alternatively, Forrest et al '725 teaches that when sufficient electromagnetic radiation incident on each face is able to traverse the device, then the layers in the subcells in the center of the device are made thicker than the layers in subcells; Forrest et al '725 teaches that the adjustment of the thickness of the sublayers is to provide uniform current levels from each cell; and, furthermore, as shown by Sato et al and Hanak, the adjustment of the thickness of subcell layers in multi-subcell solar cell

devices so that each subcell produces equal current is a well known concept in the solar cell art.

With respect to claim 25, and as noted above, Forrest et al '725 discloses a semitransparent metallic layer of, for example, 10% Ag and 90% M, which has a thickness of 100 Angstroms or less, whereas claim 25 calls for a thickness of less than about 20 Angstroms. However, in the absence of anything unexpected, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Forrest et al '725's semitransparent metallic layer with a thickness of less than about 20 Angstrom because Forrest et al '725 discloses a semitransparent metallic layer of, for example, 10% Ag and 90% M, which has a thickness of 100 Angstrom or less, which encompasses the instantly claimed range.

6. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al '725 in view of Sato et al and Hanak as applied to claims 18, 19, 22-25, and 29 above, and further in view of Peumans et al, "Efficient photon harvesting at high optical intensities in ultrathin organic double–heterostructure photovoltaic devices," Applied Physics Letters, vol. 76(19), pages 2650-2652, May 8, 2000.

Forrest et al '725 in view of Sato et al and Hanak, as relied upon for the reasons recited above, teaches the limitations of the instant claims 20 and 21, the difference being that Forrest et al '725 does not teach the presence of an exciton blocking layer in its stacked organic photosensitive optoelectronic device. Peumans et al teaches that inserting an exciton blocking layer (EBL), such as BCP, between the photoactive region and the metal cathode of an organic photovoltaic device provides the advantages of

increasing the efficiency, preventing damage due to cathode evaporation, eliminating parasitic exciton quenching at the electron-acceptor/cathode interface, and increasing the light absorption efficiency (see abstract; and the third paragraph on page 2650). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an EBL between the photoactive region and a metal cathode of Forrest et al '725's stacked organic photosensitive optoelectronic devices because the inclusion of the EBL would provide the advantages of increasing the efficiency, preventing damage due to cathode evaporation, eliminating parasitic exciton quenching at the electron-acceptor/cathode interface, and increasing the light absorption efficiency, as taught by Peumans et al.

7. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al '725 in view of Sato et al and Hanak as applied to claims 18, 19, 22-25, and 29 above, and further in view of Pettersson et al, "Modeling photocurrent action spectra of photovoltaic devices based on organic thin films," Journal of Applied Physics, vol. 86, no. 1. pages 487-496, July 1, 1999.

Forrest et al '725 in view of Sato et al and Hanak, as relied upon for the reasons recited above, teaches the limitations of instant claims 27 and 28, the difference being that Forrest et al '725 does not specifically teach presence of an anode-smoothing layer such as PEDOT in its stacked organic photosensitive optoelectronic device. Pettersson et al teaches an organic thin film photovoltaic device comprising an ITO anode; a PEDOT-PSS layer which reads on the instant anode-smoothing layer; a PEOPT hole transport layer; a C_{60} fullerene layer electron transport layer; and an aluminum cathode

(see pages 487-488). The PEDOT-PSS layer is used because it provides for better injection/collection conditions resulting in improved current-voltage characteristics compared to ITO/PEOPT. (see page 488, first column). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a PEDOT-PSS layer in Forrest et al '725's device because the PEDOT-PSS layer provides for better injection/collection conditions resulting in improved current-voltage characteristics compared to ITO/PEOPT, as taught by Pettersson et al.

8. Claims 18, 19, 22-26, 29, 30, 33, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al (WO 00/11725) in view of Sato et al (U.S. Patent 4,479,028), Hanak (U.S. Patent 4,316,049), and Lewis (U.S. Patent 4,771,321).

As seen in Figure 8A, 8B, 8C, 8D, and 9 Forrest et al '725 teaches a stacked organic photosensitive optoelectronic device that comprises in order, an anode, a plurality of photosensitive optoelectronic subcells, and a cathode (see page 1, lines 12-15; page 7, line 33 through page 37, line 1). An example of a heterojunction for a subcell in the stacked device is CuPc/PTCDA or CuPc/PTCBI (see the paragraph bridging cols. 33 and 34). Other heterojunctions are shown on Table 1 at pages 44-45, and include heterojunctions that have C_{60} buckminsterfullerene as an electron transport layer. Between each of the subcells is a semitransparent metallic layer of, for example, 10% Ag and 90% M, which has a thickness of 100 Angstroms or less (see page 34, line 12 through page 35, line 26). Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the

current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack" (see page 38, lines 22-27). Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of the device (see page 38, line 27 through page 39, line 1). Alternatively, when sufficient electromagnetic radiation incident on each face is able to traverse the device, then the layers in the subcells in the center of the device are made thicker than the layers in subcells (see page 39, lines 9-13). The adjustment of the thickness of the sublayers is to provide uniform current levels from each cell (see page 39, lines 12-13). Forrest et al '725 teaches the limitations of the instant claims, other than the differences which are discussed below.

Forrest et al '725 does not specifically recite that the current generated by two of its subcells differs by less than 10%. However as noted above, Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack" (see page 38, lines 22-27). Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of the device (see page 38, line 27 through page 39, line 1). Alternatively, when sufficient electromagnetic radiation incident on each face is able to traverse the device, then the layers in the

subcells in the center of the device are made thicker than the layers in subcells (see page 39, lines 9-13). The adjustment of the thickness of the sublayers is to provide uniform current levels from each cell (see page 39, lines 12-13). Indeed, the adjustment of the thickness of subcell layers in multi-subcell solar cell devices so that each subcell produces equal current is a well known concept in the solar cell art. For example, Sato et al teaches that "[i]n the double-layer tandem device, the maximum output current is generated when the photovoltaic current of one of the two cells is equal to the photovoltaic current of the other cell, so it is very important to select suitable thicknesses of the cells" (see col. 4, lines 23-27). Likewise, Hanak et al, at col. 3, lines 21-31, notes the adjustment of thickness so that the current produced by solar layers (38) and (42) are the same (see the paragraph bridging paragraphs 2 and 3; and col. 3, lines 43-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Forrest et al '725's stacked organic photosensitive optoelectronic device such that the current generated in a first subcell of the stack is equal to or essentially equal to the current produced by a second subcell in the stack because Forrest et al '725 teaches that a stacked device which is connected in series as in embodiment 8D00 in Figure 8D, "fundamental current continuity considerations constrain the device's current output so that it is limited to the current which goes through the subcell generating the least current regardless of the relative position of a subcell in the stack"; Forrest et al '725 addresses this problem by varying the thickness of the photoconductive organic layers, e.g., such that each subcell has exponentially thicker photoconductive organic layers if measured starting at the top of

the device; alternatively, Forrest et al '725 teaches that when sufficient electromagnetic radiation incident on each face is able to traverse the device, then the layers in the subcells in the center of the device are made thicker than the layers in subcells; Forrest et al '725 teaches that the adjustment of the thickness of the sublayers is to provide uniform current levels from each cell; and, furthermore, as shown by Sato et al and Hanak, the adjustment of the thickness of subcell layers in multi-subcell solar cell devices so that each subcell produces equal current is a well known concept in the solar cell art.

With respect to claims 26, 30, 33, and 37, Forrest et al '725 does not specifically teach that its semitransparent metallic layer between subcells can be the instant nanoparticle layer. Lewis teaches between subcells of a stacked photovoltaic device there can be used a thin layer of ohmic conductive substance, such as aluminum, where said layer forms beads which serve as a shorting interconnect while passing a large fraction of the radiation to the lower subcells and permitting lattice-matching between the subcells to be preserved (see abstract; col. 3, line 15 through col. 4, line 23; claim 12 at col. 12; and Figure 1. The beads are nanoparticles in view of their dimensions (see claim 13 at col. 12). The method of forming Lewis' interconnect is simple, rugged, and reliable (see col. 4, lines 11-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Lewis' beaded interconnect layer for the metallic layer between subcells in Forrest et al '725's device because Lewis teaches that its beaded layer serves as a shorting interconnect while passing a large fraction of the radiation to the lower subcells and permitting lattice-

matching between the subcells to be preserved, and the method for preparing the beaded layer is simple, rugged, and reliable.

9. Claims 20, 21, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al '725 in view of Sato et al, Hanak, and Lewis as applied to claims 18, 19, 22-26, 29, 30, 33, and 37 above, and further in view of Peumans et al, "Efficient photon harvesting at high optical intensities in ultrathin organic double–heterostructure photovoltaic devices," Applied Physics Letters, vol. 76(19), pages 2650-2652, May 8, 2000.

Forrest et al '725 in view of Sato et al, Hanak, and Lewis, as relied upon for the reasons recited above, teaches the limitations of the instant claims 20, 21, 31, and 32, the difference being that Forrest et al '725 does not teach the presence of an exciton blocking layer in its stacked organic photosensitive optoelectronic device. Peumans et al teaches that inserting an exciton blocking layer (EBL), such as BCP, between the photoactive region and the metal cathode of an organic photovoltaic device provides the advantages of increasing the efficiency, preventing damage due to cathode evaporation, eliminating parasitic exciton quenching at the electron-acceptor/cathode interface, and increasing the light absorption efficiency (see abstract; and the third paragraph on page 2650). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an EBL between the photoactive region and a metal cathode of Forrest et al '725's stacked organic photosensitive optoelectronic devices because the inclusion of the EBL would provide the advantages of increasing the efficiency, preventing damage due to cathode evaporation, eliminating

parasitic exciton quenching at the electron-acceptor/cathode interface, and increasing the light absorption efficiency, as taught by Peumans et al.

10. Claims 27, 28, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al '725 in view of Sato et al, Hanak, and Lewis as applied to claims 18, 19, 22-26, 29, 30, 33, and 37 above, and further in view of Pettersson et al, "Modeling photocurrent action spectra of photovoltaic devices based on organic thin films," Journal of Applied Physics, vol. 86, no. 1. pages 487-496, July 1, 1999.

Forrest et al '725 in view of Sato et al, Hanak, and Lewis as relied upon for the reasons recited above, teaches the limitations of instant claims 27 28, 35, and 36, the difference being that Forrest et al '725 does not specifically teach presence of an anode-smoothing layer such as PEDOT in its stacked organic photosensitive optoelectronic device. Pettersson et al teaches an organic thin film photovoltaic device comprising an ITO anode; a PEDOT-PSS layer which reads on the instant anode-smoothing layer; a PEOPT hole transport layer; a C_{60} fullerene layer electron transport layer; and an aluminum cathode (see pages 487-488). The PEDOT-PSS layer is used because it provides for better injection/collection conditions resulting in improved current-voltage characteristics compared to ITO/PEOPT. (see page 488, first column). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a PEDOT-PSS layer in Forrest et al '725's device because the PEDOT-PSS layer provides for better injection/collection conditions resulting in improved current-voltage characteristics compared to ITO/PEOPT, as taught by Pettersson et al.

11. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al '725 in view of Sato et al, Hanak, and Lewis as applied to claims 18, 19, 22-26, 29, 30, 33, and 37 above, and further in view of Aratani et al (U.S. Patent 5,854,139).

Forrest et al '725 in view of Sato et al, Hanak, and Lewis are relied upon for the reasons recited above. Forrest et al '725 in view of Sato et al, Hanak, and Lewis teach the limitations of claim 34, the difference being that Lewis does not specifically teach that its layer of high ohmic conductance material can be made from silver, as in instant claim 34. Lewis does teach that its layer of high ohmic conductance material can be made from a material such as indium, gallium, aluminum, etc (see col. 3, lines 36-37). Aratani et al teaches what is very well known, i.e., materials such as indium, aluminum, copper, etc, are interchangeably used for ohmic contact materials (see the paragraph bridging cols. 8 and 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used copper in place of indium or aluminum for Lewis' high ohmic conductance material because the substitution of art recognized equivalents, as shown by Aratani et al, would have been within the level of ordinary skill in the art.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.

1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 18-37 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,657,378. Although the conflicting claims are not identical, they are not patentably distinct from each other because instant claim 18 recites that the layers are "in order", but no order of layers is given in the claims of said patent. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared the device in claim 1 of said patent with the layers of said device formed in the order that they are recited in said patent because such clearly would have been within the skill of an artisan practicing claim 1 of said patent. With respect to instant claim 30, note that claim 14 in said patent recites the instant nanoparticle layer.

14. Claims 18-37 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of U.S. Patent No. 6,198,091. Although the conflicting claims are not identical, they are not patentably distinct from each other because note that claim 6 of said patent teaches that each of the subcells is selected so that each of the subassemblies will generate substantially the same voltage when the device is exposed to ambient electromagnetic radiation.

15. Claims 18-37 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-27 of U.S. Patent No. 6,198,092. Although the conflicting claims are not identical, they are not patentably distinct from each other because note that claim 3 of said patent teaches that each of the organic photosensitive optoelectronic subcells is selected to maximize the total current output of the device. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected each of the subcells to have an equal or approximately equal current output so as to maximize total current output.

16. Claims 18-37 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 of copending Application No. 10/822,774. Although the conflicting claims are not identical, they are not patentably distinct from each other because note in claim 30 of said copending application that the first organic layer (i.e., first subcell) and second organic layer (i.e., second subcell) can contribute the same amount of photocurrent to the device.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. Claims 18-37 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-32 of copending Application No. 10/910,371. Although the conflicting claims are not identical, they are not patentably distinct from each other because note in claim 7 of said copending application that the first organic layer (i.e., first subcell) and second organic

layer (i.e., second subcell) can contribute the same amount of photocurrent to the device.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 6,278,055, 6,297,495, 6,352,777, 6,451,415, 6,580,027, 6,692,820, and 6,774,300 are hereby made of record.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
December 2, 2005